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| 09/816,672 | 03/26/2001 | Hiroyuki Ide | 010428 | 5731 |

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07/21/2004

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EXAMINER

TILLERY, RASHAWN N

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/816,672

Applicant(s)

IDE ET AL.

Examiner

Rashawn N Tillery

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 77 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohta (US5101276).

Regarding claim 1, Ohta discloses, in figures 1, 2A-2E and 3, a digital camera comprising:

an image sensor (3) formed, in a light-receiving surface, with a plurality of first light-receiving elements (field B in each pixel) and a plurality of second light-receiving elements (field A in each pixel);

a first exposurer for subjecting the first light-receiving elements to first exposure (field B in 2C) for a first period (short integration time);

a second exposurer for subjecting the second light-receiving elements to second exposure (field A in 2B) for a second period (long integration time);

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an outputter for separately outputting, from the image sensor, a first charge produced in the first light-receiving elements due to the first exposure and a second charge produced in the second light-receiving elements due to the second exposure (Ohta reads out the signal of field B and then the signal of field A; see col. 7, line 59 to col. 8, line 32); and

a generator for generating a still image signal of one screen on the basis of the first charge and the second charge, wherein the first period is shorter than the second period and overlapped in time with the second period (Ohta teaches combining images of different exposures; see col. 8, lines 42-59).

Regarding claim 7, Ohta discloses the image sensor is an interline-transfer CCD imager formed with a plurality of vertical transfer registers in the light-receiving surface (see col. 9, line 51).

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Yadid-Pecht et al (US6115065).

Regarding claim 1, Yadid-Pecht discloses, in figure 2, a digital camera comprising:

an image sensor (200) formed, in a light-receiving surface (202), with a plurality of first light-receiving elements (220) and a plurality of second light-receiving elements (210);

a first exposer (Yadid-Pecht teaches a control circuit for varying integration times; see col. 4, lines 59-65) for subjecting the first light-receiving elements to first exposure for a first period (short integration time);

a second exposer (Yadid-Pecht teaches a control circuit for varying integration times; see col. 4, lines 59-65) for subjecting the second light-receiving elements to second exposure for a second period (long integration time);

an outputter (204 and 206) for separately outputting, from the image sensor, a first charge produced in the first light-receiving elements due to the first exposure and a second charge produced in the second light-receiving elements due to the second exposure (Yadid-Pecht reads out all the pixels of the array to the 2nd column-parallel signal chain at a short integration time and reads out all the pixels of the array to the 1st column-parallel signal chain at a long integration time); and

a generator for generating a still image signal of one screen on the basis of the first charge and the second charge, wherein the first period is shorter than the second period and overlapped in time with the second period (Yadid-Pecht teaches reconstructing an image by combining data of a short integration time with data of a long integration time; see col. 5, line 18 to col. 6, line 31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta.

Regarding claim 2, Ohta discloses, in separate embodiments of figures 7A-D and 8A-E,

a first applier to apply a first charge read pulse (V13) to the first light-receiving elements, a second applier to apply a second charge read pulse (V11) to the second light-receiving elements, a third applier to apply a charge sweep-out pulse (Ohta teaches discarding signal charges of fields A and B; field A charges are discarded at 1 in figure 7B and field B charges are discarded at 2 in figure 7C) to the first light-receiving elements and the second light-receiving elements (see col. 9, lines 50-62).

Ohta does not expressly disclose the use of a mechanical shutter in the embodiment disclosed in figure 7. In the embodiment of figure 8, Ohta reveals that it is well known in the art to utilize a mechanical shutter for exposure (see col. 9, line 63 to col. 10, line 7).

Thus, Ohta discloses, in figures 8B and 8D, the first exposur controls any two of the first applier, the third applier and the shutter member to mechanically cut off incident

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light on the light-receiving surface since charge is swept out of field B at the beginning of exposure in figure 7C (third applier) and exposure of field B ends at the close of the shutter in figure 8D; while the second exposer controls any two of the second applier, the third applier and the shutter member to mechanically carry out the second exposure since exposure of field A begins at the open of the shutter (second applier) and ends at the close of the shutter.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ohta's figure 7 embodiment by including a mechanical shutter in an effort to reduce the amount of smear.

Regarding claim 3, Ohta discloses, in figures 7B, 7C, 8B and 8D, the first exposer controls start and end time points of the first exposure by the third and first appliers (in figure 7C, field B starts when charges are discarded at 2 and ends at 3) and the second exposer controls start and end time points of the second exposure by the third applier and the shutter member (in figure 7B, field A starts when charges are discarded at 1 and ends at 4 which would coincide with the open and close of the shutter in figure 8B).

Regarding claim 4, see claim 2 above.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yadid-Pecht et al in view of Ishikawa et al (US4670777).

Regarding claim 5, Yadid-Pecht teaches an image sensor capable of producing at least two integration times from each pixel. Yadid-Pecht does not expressly disclose a color filter covering the light-receiving surface. Ishikawa teaches a method for

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processing color image signals. Ishikawa reveals that it is well known in the art to alternately assign colors to all the pixels of an array. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yadid-Pecht's device by implementing Ishikawa's teachings (see the Abstract). One would have been motivated to do so in an effort to expand the dynamic range by utilizing the green filter more efficiently.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 6, the prior art does not teach or fairly suggest a digital camera comprising an image sensor formed with a plurality of first and second light-receiving elements, a first exposer for subjecting the first elements to a first exposure for a first period, a second exposer for subjecting the second elements to a second exposure for a second period, an outputter for outputting a first and second charge, a generator for generating an image from the first and second charge and a color filter, wherein

the color filter comprises a plurality of color blocks including each of the blocks, the first and second light-receiving elements being alternately arranged, in a predetermined number in each, in at least one of the vertical and horizontal directions.

Conclusion

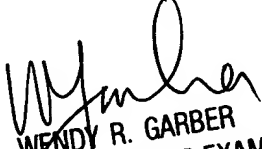
1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yanai teaches a method for processing color signals. Kamishima et al teach an imager with a long and short exposure time. Morimura teaches an imaging method with variable integration times. Tanaka et al teach a CCD imaging device. Lee et al teach an integrated CMOS active pixel camera. Afghahi teaches an integrated CMOS imager. Fossum et al teach an APS with intra-pixel charge transfer. Yadid-Pecht et al teach an imager with variable integration times. Ikeda et al teach image data processing which can combine a plurality of images at different exposures.
2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rashawn N Tillery whose telephone number is 703-305-0627. The examiner can normally be reached on 9AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RNT


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